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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/721,179	11/26/2003	Jong Chul Bang	K-0586	6624

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KED & ASSOCIATES, LLP  
P.O. Box 221200  
Chantilly, VA 20153-1200

EXAMINER
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RINEHART, KENNETH

ART UNIT	PAPER NUMBER
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3749

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/11/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/721,179

Applicant(s)

BANG, JONG CHUL

Examiner

Kenneth B. Rinehart

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 March 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4,6,7,9-13,15,16,18,20,21,23-29,31,32 and 37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4,6,7,9-13,15,16,18,20,21,23-29,31,32 and 37 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 4/5/05, 1/26/03 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-4, 6,7,9-13, 15,16,18,20-21,23,24-29,31, 37 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 24-29, 31, 32, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sherrill (5925273). Sherrill discloses a heater case having an air passage formed therein (fig. 1); a plate configured to partition the air passage into an upper passage and a lower passage (14, fig. 2); and independent first and second coil arrays provided in the air passage and configured to alternately cross the plate between the upper and lower passages (22a, 22b, fig. 2), a plurality of first coils of the first coil array are positioned at a predetermined distance from a corresponding plurality of second coils of the second coil array (fig. 2), each of the first and second coil arrays is electrically connected as a single unit (fig. 2), the first and second coil arrays each comprise a plurality of coils provided at upper and lower portions of each coil array (fig. 2), the plurality of first coils of the first coil array are positioned at a predetermined interval in an airflow direction from the corresponding plurality of second coils of the second coil array (fig. 2), the first and second coil arrays are configured to be separately controlled (col. 3, lines 22-30), the first and second coil arrays are configured to alternately to cross the plate between

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the upper and lower passages (col. 3, lines 22-30), a dryer comprising the heater assembly of claim 10 (col. 2, line 45), the first coil array is symmetrical to the second coil array along a predetermined line of symmetry of the air passage (fig. 2), a heater case (fig. 1); a plate provided in the case and configured to partition the case into an upper portion and a lower portion (14, fig. 2); a first coil array comprising a plurality of upper first coils, the plurality of first coils comprising a plurality of upper first coils positioned in the upper portion of the case, and a plurality of lower first coils positioned in the lower portion of the case (fig. 2); and a second coil array comprising a plurality of second coils, the plurality of second coils comprising a plurality of upper second coils positioned in the upper portion of the case, and a plurality of lower second coils positioned in the lower portion of the case (fig. 2), wherein the first coil array is symmetrical to the second coil array about the plate (fig. 2), wherein the first coil array is configured to operate as a single unit, and wherein the plurality of first coils are arranged in the first coil array such that the upper and lower first coils form an alternating pattern (fig. 2), The first coil array is configured to cross the plate as the first coil array alternates between the upper and lower first coils (fig. 2), The second coil array is configured to operate as a single unit independent of the first coil array, and wherein the plurality of second coils are arranged in the second coil array such that the upper and lower second coils form an alternating pattern (col. 3, lines 22-28), the alternating pattern formed by the upper and lower first coils is a mirror image of the alternating pattern formed by the upper and lower second coils (fig. 2), the second coil array is configured to cross the plate as the second coil array alternates between the upper and lower second coils (fig. 2), the first and second coil arrays each form a zigzag pattern (fig. 2), the heater of claim 24 (fig. 2), the first and second coil arrays are configured to alternately cross the plate so as to form a

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zigzag pattern (fig. 2), the plurality of upper first and second coils form an alternating pattern in the upper portion of the case, and the plurality of lower first and second coils form an alternating pattern in the lower portion of the case (coils are in succession, fig. 2), and a span of the first coil array overlaps a span of the second coil array (When viewed from the right side of figure 2, the spans overlap. The spans occupy a common area). Sherrill discloses applicant's invention substantially as claimed with the exception of the plurality of upper first and second coils are arranged in the upper portion such that an upper first coil is disposed between two upper second coils and an upper second coil is disposed between two upper first coils so as to form an alternating pattern of upper first and second coils in the upper portion, and the plurality of lower first and second coils are arranged in the lower portion such that a lower first coil is disposed between two lower second coils and a lower second coil is disposed between two lower first coils so as to form an alternating pattern of lower first and second coils in the lower portion. It would have been obvious to one having ordinary skill in the art at the time the invention was made to the plurality of upper first and second coils are arranged in the upper portion such that an upper first coil is disposed between two upper second coils and an upper second coil is disposed between two upper first coils so as to form an alternating pattern of upper first and second coils in the upper portion, and the plurality of lower first and second coils are arranged in the lower portion such that a lower first coil is disposed between two lower second coils and a lower second coil is disposed between two lower first coils so as to form an alternating pattern of lower first and second coils in the lower portion, since shifting the location of parts of a device involves only routine skill in the art.

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Claims 10-13, 15, 16, 18, 21, 23, 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sherrill (5925273). Sherrill discloses a heater case having an air passage formed therein (fig. 1); a plate configured to partition the air passage into an upper passage and a lower passage (14, fig. 2); and independent first and second coil arrays provided in the air passage and configured to alternately cross the plate between the upper and lower passages (22a, 22b, fig. 2), a plurality of first coils of the first coil array are positioned at a predetermined distance from a corresponding plurality of second coils of the second coil array (fig. 2), each of the first and second coil arrays is electrically connected as a single unit (fig. 2), the first and second coil arrays each comprise a plurality of coils provided at upper and lower portions of each coil array (fig. 2), the plurality of first coils of the first coil array are positioned at a predetermined interval in an airflow direction from the corresponding plurality of second coils of the second coil array (fig. 2), the first and second coil arrays are configured to be separately controlled (col. 3, lines 22-30), the first and second coil arrays are configured to alternately to cross the plate between the upper and lower passages (col. 3, lines 22-30), a dryer comprising the heater assembly of claim 10 (col. 2, line 45), the first coil array is symmetrical to the second coil array along a predetermined line of symmetry of the air passage (fig. 2), a heater case (fig. 1); a plate provided in the case and configured to partition the case into an upper portion and a lower portion (14, fig. 2); a first coil array comprising a plurality of upper first coils, the plurality of first coils comprising a plurality of upper first coils positioned in the upper portion of the case, and a plurality of lower first coils positioned in the lower portion of the case (fig. 2); and a second coil array comprising a plurality of second coils, the plurality of second coils comprising a plurality of upper second coils positioned in the upper portion of the case, and a plurality of

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lower second coils positioned in the lower portion of the case (fig. 2) wherein the first coil array is symmetrical to the second coil array about the plate (fig. 2), wherein the first coil array is configured to operate as a single unit, and wherein the plurality of first coils are arranged in the first coil array such that the upper and lower first coils form an alternating pattern (fig. 2), The first coil array is configured to cross the plate as the first coil array alternates between the upper and lower first coils (fig. 2), The second coil array is configured to operate as a single unit independent of the first coil array, and wherein the plurality of second coils are arranged in the second coil array such that the upper and lower second coils form an alternating pattern (col. 3, lines 22-28), the alternating pattern formed by the upper and lower first coils is a mirror image of the alternating pattern formed by the upper and lower second coils (fig. 2), the second coil array is configured to cross the plate as the second coil array alternates between the upper and lower second coils (fig. 2), the first and second coil arrays each form a zigzag pattern (fig. 2), the heater of claim 24 (fig. 2), the first and second coil arrays are configured to alternately cross the plate so as to form a zigzag pattern (fig. 2), the plurality of upper first and second coils form an alternating pattern in the upper portion of the case, and the plurality of lower first and second coils form an alternating pattern in the lower portion of the case (coils are in succession, fig. 2), and a span of the first coil array overlaps a span of the second coil array (When viewed from the right side of figure 2, the spans overlap. The spans occupy a common area). Sherrill discloses applicant's invention substantially as claimed with the exception of the first coil array comprise a plurality of first coils alternately positioned in the upper and lower passages, and the second coil array comprises a plurality of second coils alternately positioned in the upper and lower passages such that the first and second coils positioned in the upper passage form alternating pattern in the

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upper passage, and the first and second coils positioned in the lower passage form an alternating pattern in the lower passage, a coil of the first coil array is positioned between each set of adjacent second coils, in the lower passage and a second coil of the second coil array is positioned between each set of adjacent first coils in the upper passage, a coil of the first coil array is positioned between each set of adjacent second coils in the lower passage, and a second coil of the second coil array is positioned between each set of adjacent first coils in the upper passage, each of the plurality of first coils is positioned substantially directly across from a corresponding second coil of the plurality of second coils on the opposite side of the plate, the plate is positioned along the predetermined line of symmetry of the air passage, upper and lower portions of each coil array lie on centerlines of the upper and lower passages, respectively. At the time the invention was made it would have been an obvious matter of design choice to a person of ordinary skill in the art to have a plurality and first and second coils positioned, coil arrays, etc, because applicant has not disclosed that the number or location provides an advantage, is used for a particular purpose or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with either the quantity and location of Sherril since shifting the location of parts of a device or changing a quantity involves only routine skill in the art.

Claims 1-4, 6, 7, 9, 20, 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Drews et al (4700495) in view of Sherril (5925273). Drews et al discloses A dryer, comprising: a cabinet; a drum provided in the cabinet and configured to be in rotational communication with a motor; and a heater assembly coupled to the drum (fig. 2), comprising: a heater case having an air passage formed therein (fig. 3); a plate configured to partition the air passage into an upper



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passage and a lower passage (84, fig. 3), the upper and lower portions lie on centerlines of the upper and lower passages, respectively (fig. 3), the plate is positioned along the predetermined line of symmetry of the air passage (fig. 3), and a span of the first coil array overlaps a span of the second coil array (Fig. 6, When viewed from the plan view, fig. 6, the spans overlap. The spans occupy a common area.) Drews et al discloses applicant's invention substantially as claimed with the exception of and independent first and second coil arrays provided in the air passage and each configured to cross the plate between the upper and lower passages, wherein the first coil array comprises a plurality of first coils alternately positioned in the upper and lower passages, and the second coil array comprises a plurality of second coils alternately positioned in the upper and lower passages such that the first and second coils positioned in the upper passage form an alternating pattern in the upper passage, and the first and second coils positioned in the lower passage e form an alternating pattern in the lower passage, a plurality of first coils of the first coil array ate positioned at a predetermined distance from a corresponding plurality of second coils of the second coil array, the first coil array is symmetrical to the second coil array along a predetermined line of symmetry of the air passage, each of the first and second coil arrays is electrically connected as a single unit, the first and second coil arrays each comprise a plurality of coils provided at upper and lower portions of each coil array, the plurality of coils of the first coil array are positioned at a predetermined interval along an air flow direction from the corresponding plurality of coils of the second coil array, the first and second coil arrays are configured to be separately controlled, the first and second coil arrays are configured to alternately cross the plate so as to form a zigzag pattern, each of the plurality of first coils is positioned substantially directly across form a corresponding second coil of the plurality of

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second coils on the opposite side of the plate, and wherein the upper and lower portions of each of the first and second coil arrays lie on centerlines of the upper and lower passages respectively. Sherril teaches and independent first and second coil arrays provided in the air passage and each configured to cross the plate between the upper and lower passages (col. 3, lines 22-30), a plurality of first coils of the first coil array are positioned at a predetermined distance from a corresponding plurality of second coils of the second coil array (fig. 2), the first coil array is symmetrical to the second coil array along a predetermined line of symmetry of the air passage (fig. 2, col. 3, lines 10-12), each of the first and second coil arrays is electrically connected as a single unit (fig. 2), the first and second coil arrays each comprise a plurality of coils provided at upper and lower portions of each coil array (fig. 2), the plurality of coils of the first coil array are positioned at a predetermined interval along an air flow direction from the corresponding plurality of coils of the second coil array (fig. 2), the first and second coil arrays are configured to be separately controlled (col. 3, lines 22-30), the first and second coil arrays are configured to alternately cross the plate so as to form a zigzag pattern (fig. 2), wherein the first coil array comprises a plurality of first coils alternately positioned in the upper and lower passages, and the second coil array comprises a plurality of second coils alternately positioned in the upper and lower passages such that the first and second coils positioned in the upper passage form an alternating pattern, and the first and second coils positioned in the lower passage e form an alternating pattern, (coils are in succession, fig. 2) for the purpose of improving marketability of the product. It would have been obvious to one of ordinary skill in the art to modify Drews et al by including and independent first and second coil arrays provided in the air passage and each configured to cross the plate between the upper and lower passages, a plurality of first coils of

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the first coil array are positioned at a predetermined distance from a corresponding plurality of second coils of the second coil array, the first coil array is symmetrical to the second coil array along a predetermined line of symmetry of the air passage, each of the first and second coil arrays is electrically connected as a single unit, the first and second coil arrays each comprise a plurality of coils provided at upper and lower portions of each coil array, the plurality of coils of the first coil array are positioned at a predetermined interval along an air flow direction from the corresponding plurality of coils of the second coil array, the first and second coil arrays are configured to be separately controlled, the first and second coil arrays are configured to alternately cross the plate so as to form a zigzag pattern, wherein the first coil array comprises a plurality of first coils alternately positioned in the upper and lower passages, and the second coil array comprises a plurality of second coils alternately positioned in the upper and lower passages such that the first and second coils positioned in the upper passage form an alternating pattern, and the first and second coils positioned in the lower passage form an alternating pattern, each of the plurality of first coils is positioned substantially directly across from a corresponding second coil of the plurality of second coils on the opposite side of the plate as taught by Sherril for the purpose of improving marketability of the product. Drews in view of Sherrill discloses applicant's invention substantially as claimed with the exception of upper and lower portions of each of the first and second coil arrays lie on centerlines of the upper and lower passages, each of the plurality of first coils is positioned substantially directly across from a corresponding second coil of the plurality of second coils on the opposite side of the plate, and wherein the upper and lower portions of each of the first and second coil arrays lie on centerlines of the upper and lower passages respectively. At the time the invention was made it would have been an obvious matter

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of design choice to a person of ordinary skill in the art to have upper and lower portions of each of the first and second coil arrays lie on centerlines of the upper and lower passages, each of the plurality of first coils is positioned substantially directly across from a corresponding second coil of the plurality of second coils on the opposite side of the plate, and wherein the upper and lower portions of each of the first and second coil arrays lie on centerlines of the upper and lower passages respectively since shifting the location of parts of a device involves only routine skill in the art.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth B. Rinehart whose telephone number is 571-272-4881. The examiner can normally be reached on 7:20 -4:20.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Josiah Cocks can be reached on 571-272-4874. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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KENNETH RINEHART  
PRIMARY EXAMINER